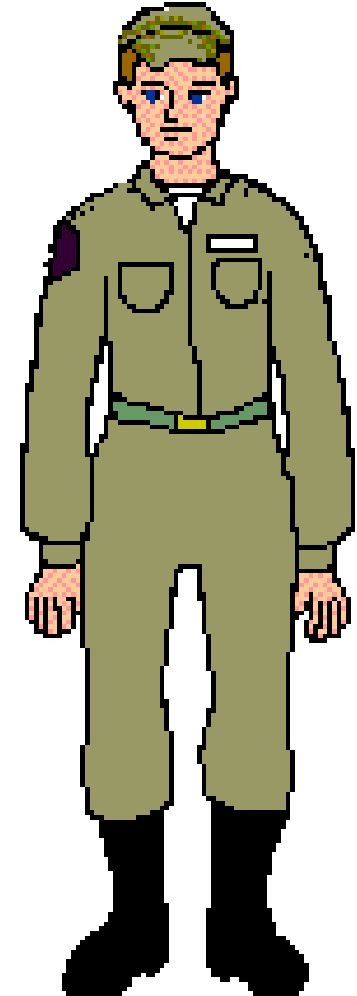




Armed Forces College of Medicine AFCM





Injury of the Brachial Plexus

By

Prof Azza Kamal

ILOs



By the end of this lecture, each student should be able to:

- ❑ Summarize the branches of the brachial plexus
- ❑ Describe the causes, muscles affected and deformity resulting from injury of:
 - 1) Whole brachial plexus
 - 2) Upper trunk of brachial plexus
 - 3) Lower trunk of brachial plexus
- ❑ Discuss the causes and effect of injury of long thoracic nerve

KEY POINTS

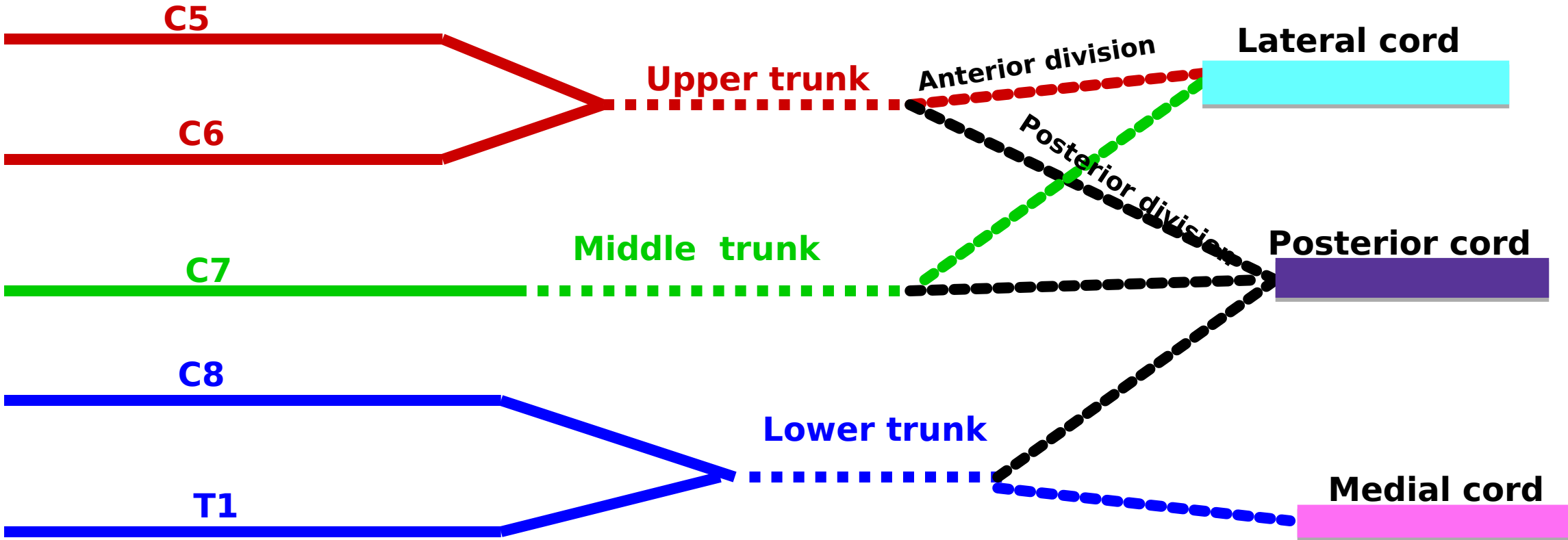
- ❑ Branches of the roots, trunks & cords of the brachial plexus
- ❑ Injuries of the brachial plexus:
 - 1) Whole brachial plexus
 - 2) Upper trunk of brachial plexus
 - 3) Lower trunk of brachial plexus
- ❑ Injury of the long thoracic nerve

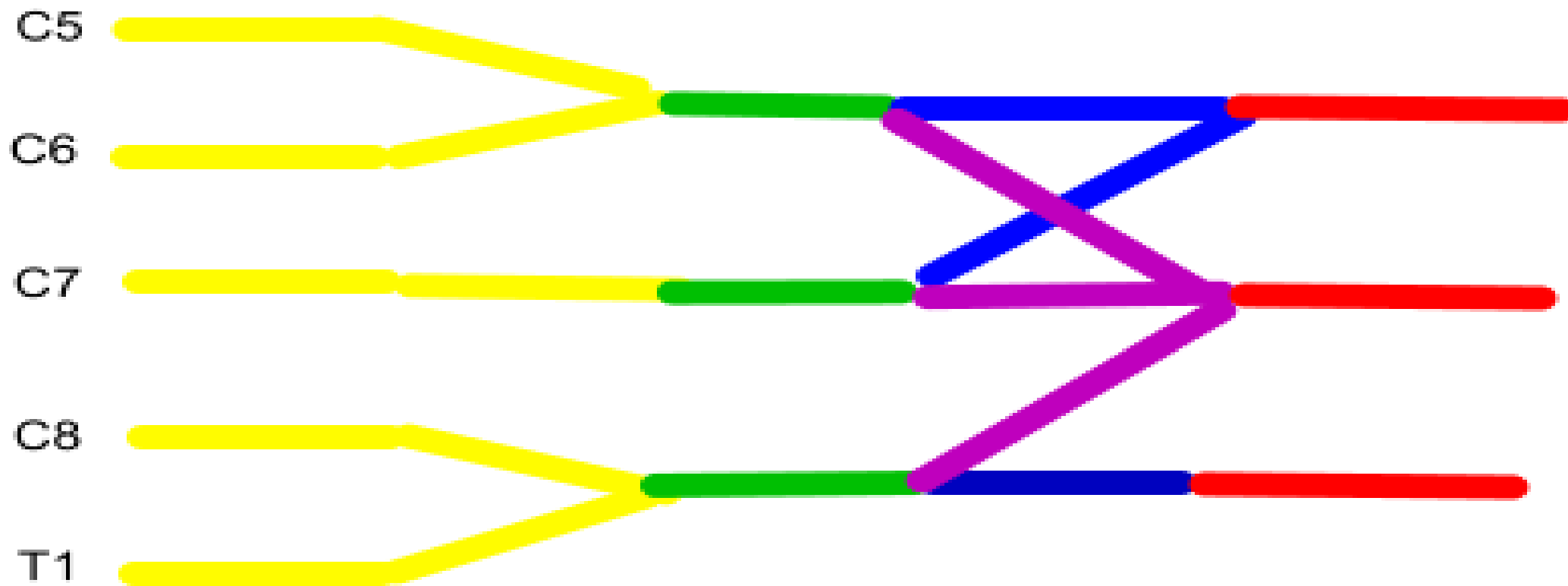
Roots

Trunks

Divisions

Cords





Branches of Brachial Plexus

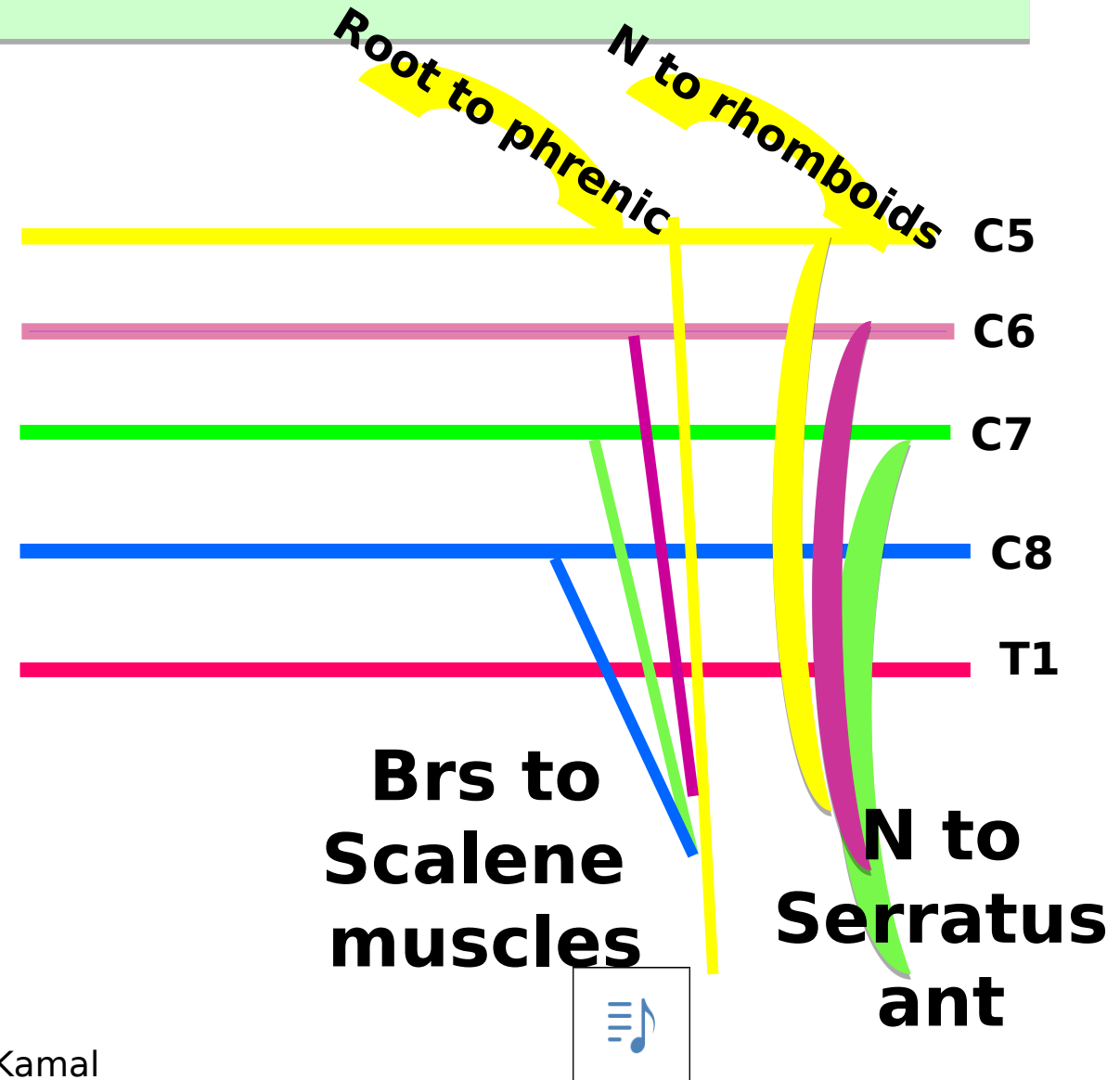
1) Branches from roots:

A. Dorsal scapular
(n. to rhomboids) C5

B. A root to phrenic nerve C5

c. Long thoracic C5,6,7
(n. to serratus anterior)

D. Muscular brs to scalene muscles C5,6,7,8

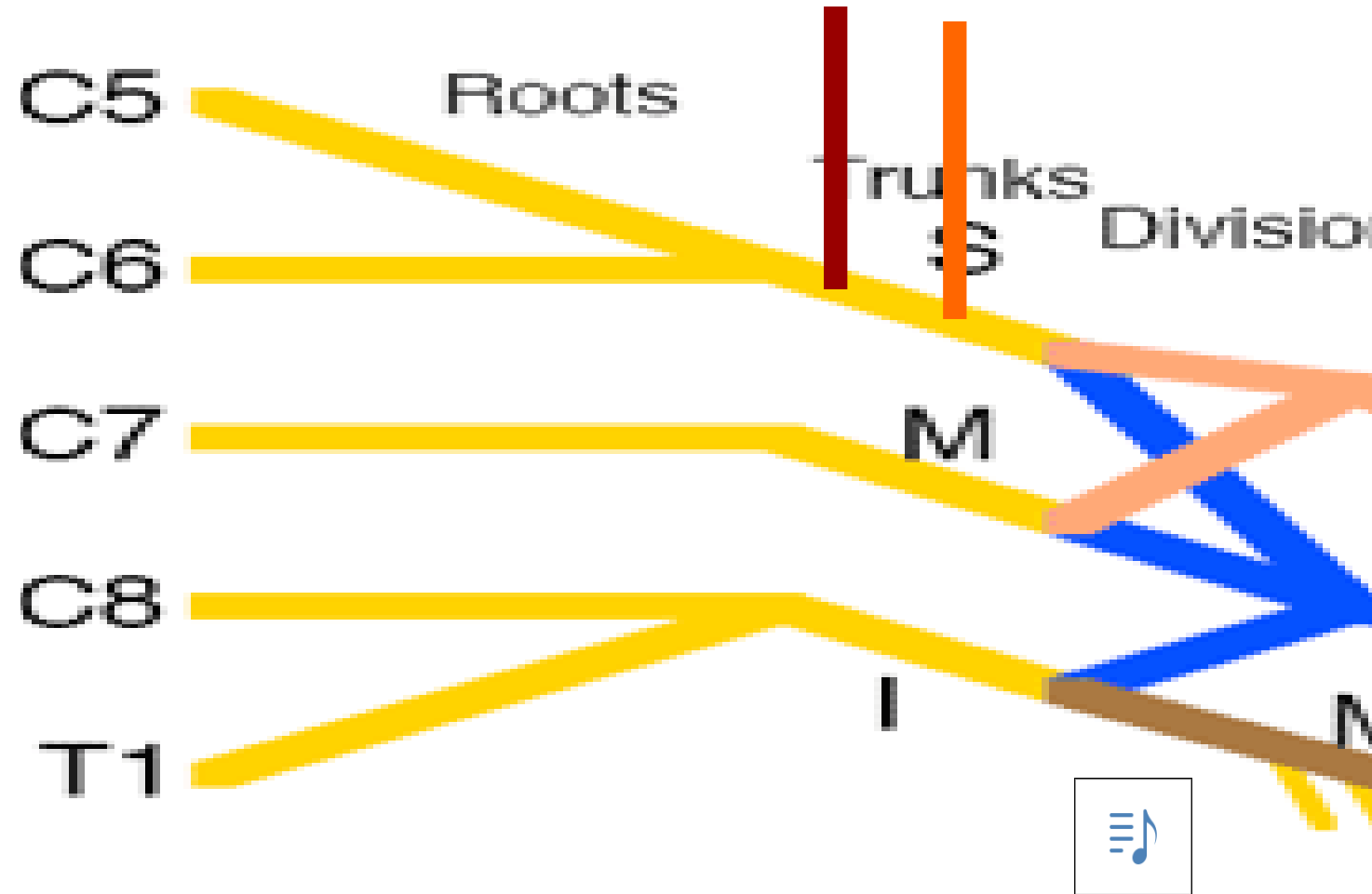


Branches of Brachial Plexus

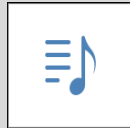
Branches from trunks
Only upper

{Superior}
trunk gives
branches :

A. **S**uprascapular
nerve (for
supraspinatus &
infraspinatus)



- **Divisions give NO branches**

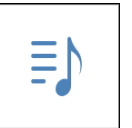
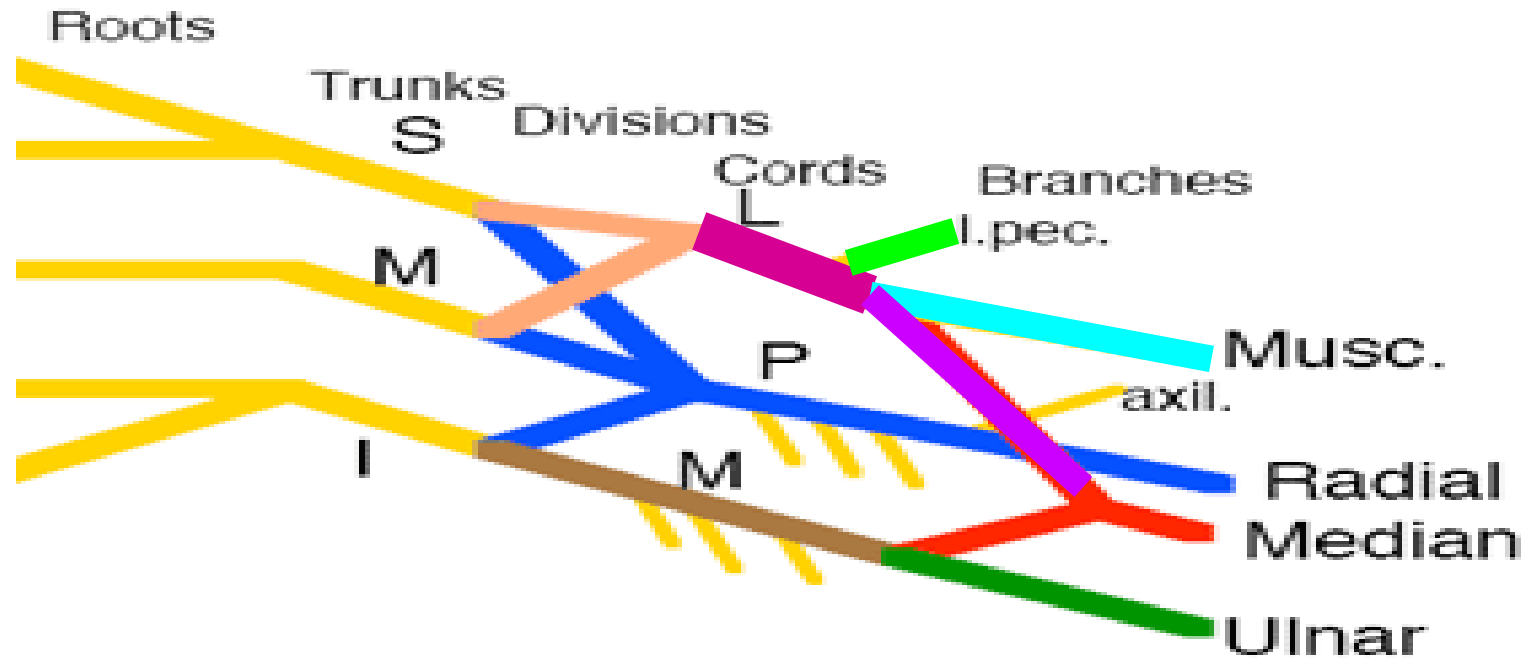


- **Branches from cords :**

- 1) Lateral cord
:

- **Lateral pectoral**
- **Musculocutaneous**
- **Lateral root of median**

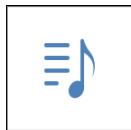
3 branches



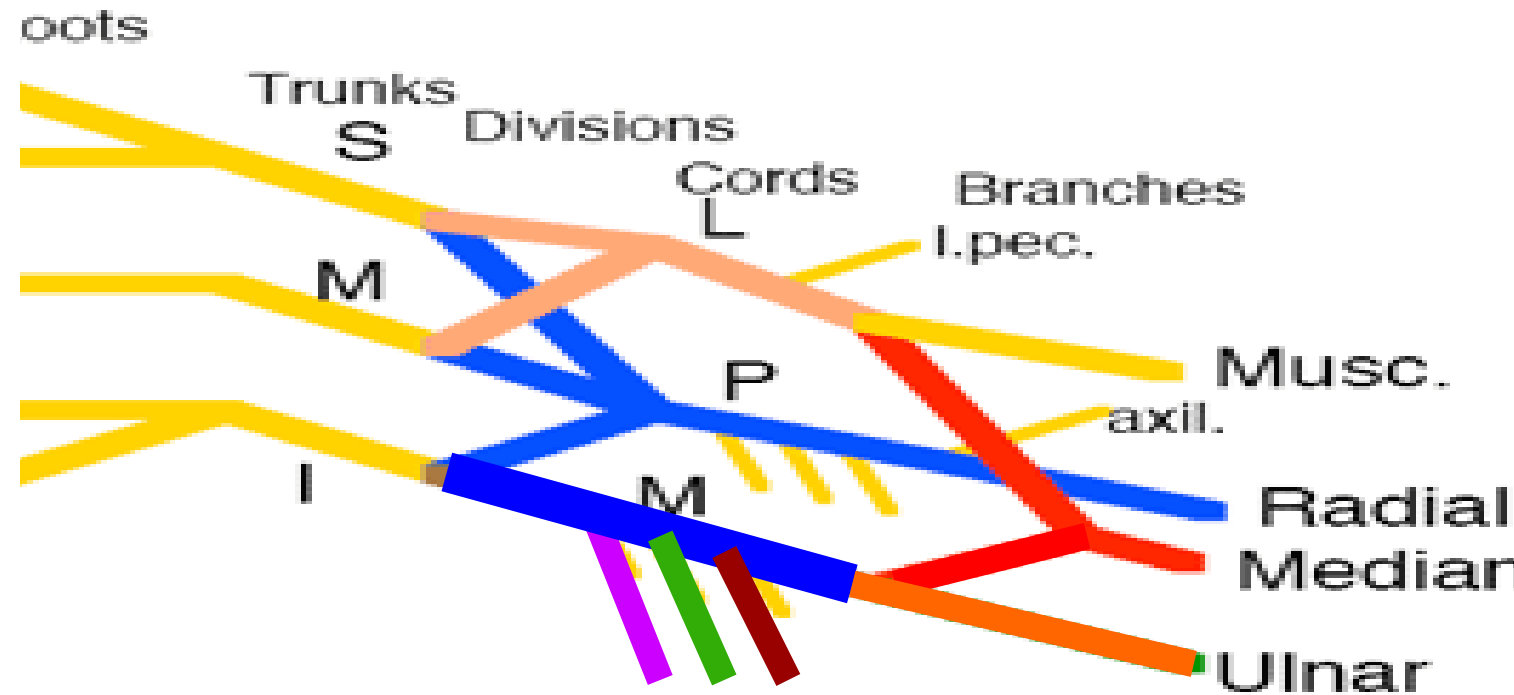
➤ Branches from cords:

2) Medial Cord:

- Medial **pectoral**
- Medial **cutaneous** of arm
- Medial **cutaneous** of forearm
- Medial **root of median**
- **Ulnar nerve**



5 branches

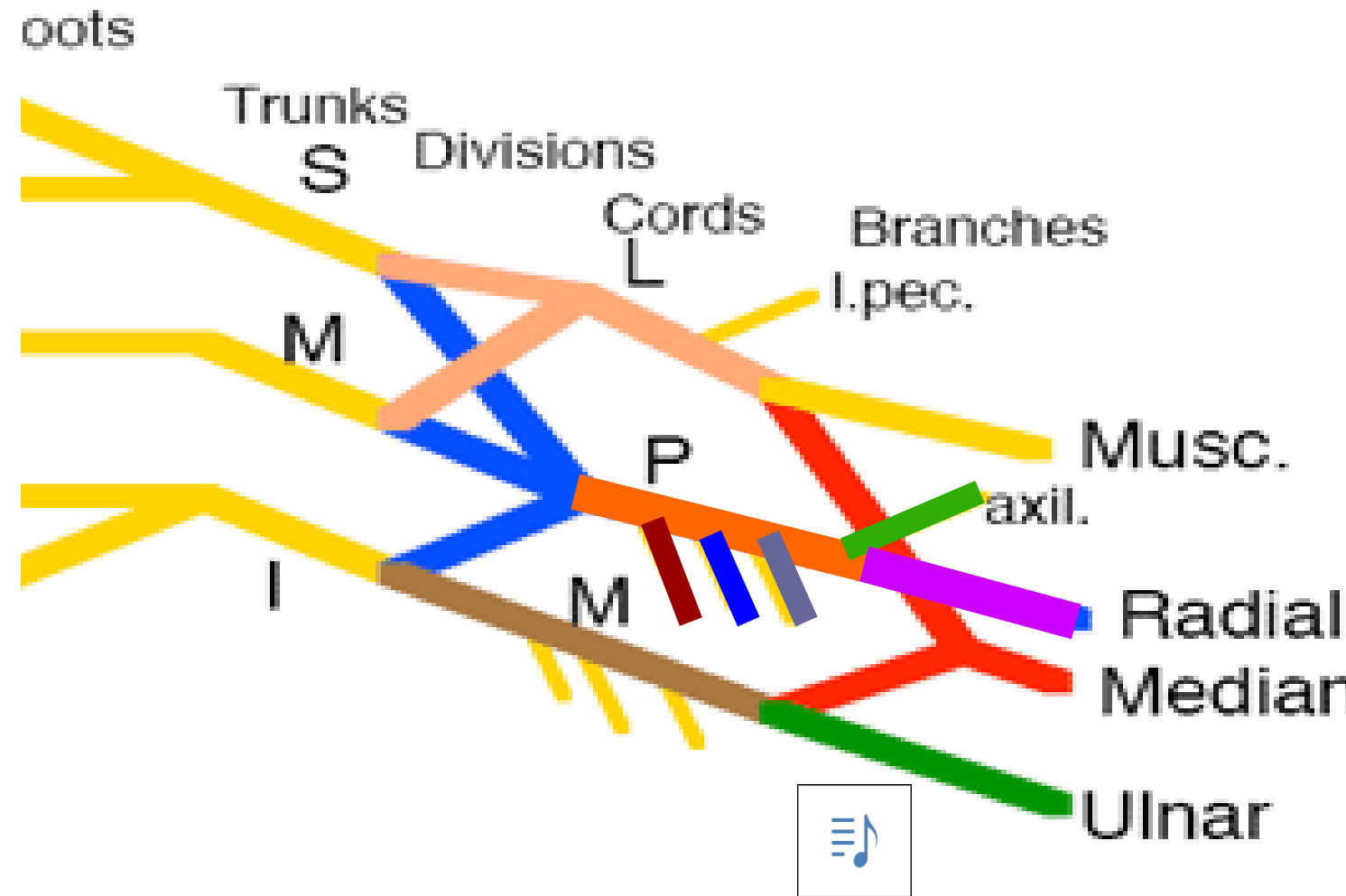


- **Branches from cords :**

3) Posterior cord :

- **Upper subscapular**
- **Lower subscapular**
- **Nerve to latissimus dorsi**
- **Axillary nerve**
- **Radial nerve**

5 branches



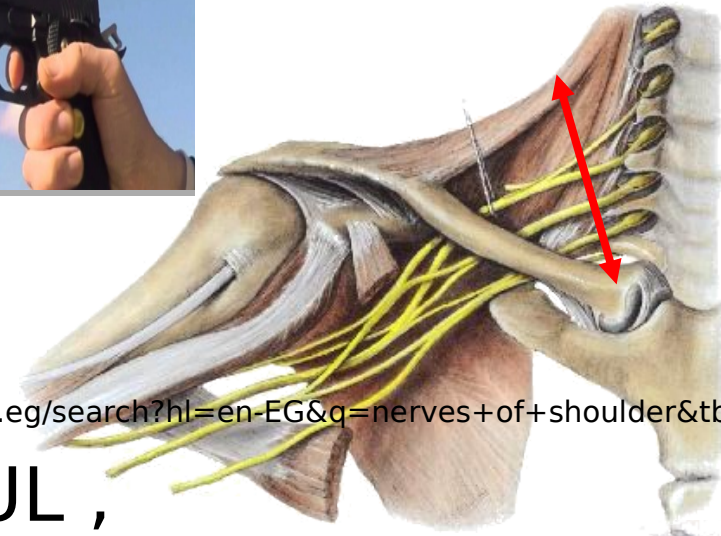
All the following are branches from the medial cord of the brachial plexus, Except:

- a) Medial root of median
- b) Ulnar
- c) Medial cutaneous of arm
- d) Axillary
- e) Medial pectoral

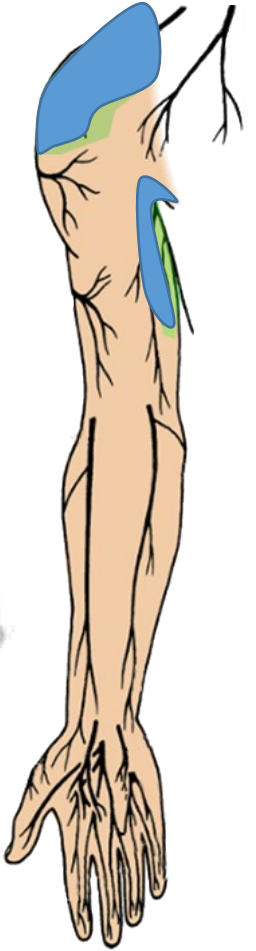
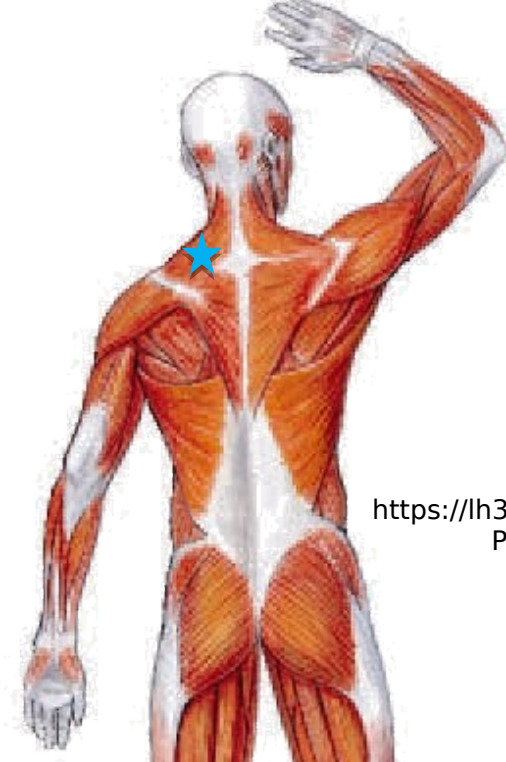
Brachial Plexus Injury

WHOLE PLEXUS

- **Cause:** gunshot wounds
- **Effects:**
 - **Motor** □ **Paralysis** of whole UL ,
except
 - trapezius □ spinal accessory and levator scapulae □ C3,4
 - **Sensory** □ **Anesthesia** whole UL, except
 - Skin over upper part of deltoid (lat. supraclavicular n.) □ C3,4
 - Floor of axilla & upper medial side of arm (2nd intercostal n.) □ T2



<https://www.google.com.eg/search?hl=en-EG&q=nerves+of+shoulder&tbm>

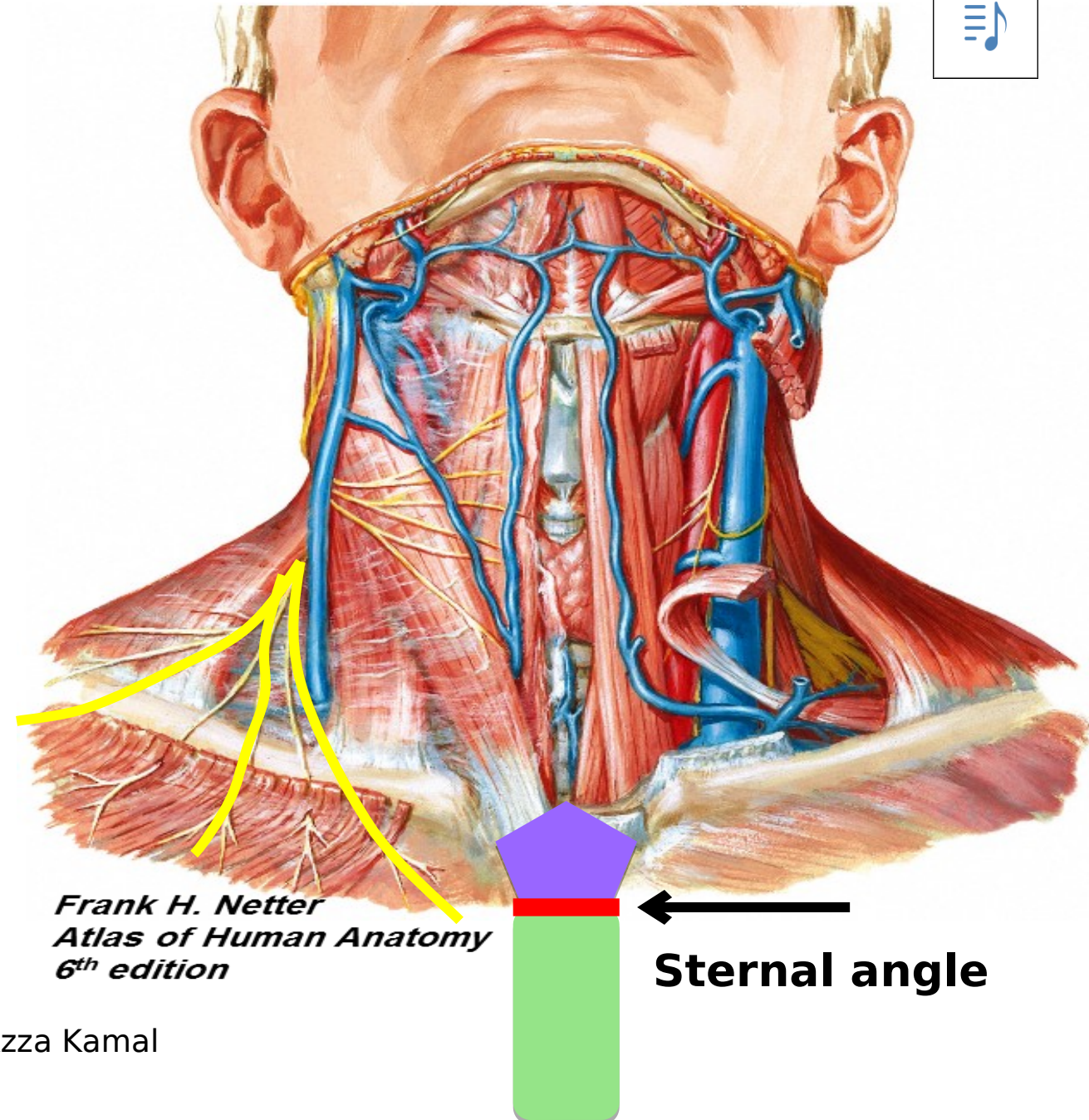


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Cutaneous Nerve Supply of Pectoral Region:

- ❑ Supraclavicular nerves C3,4: **medial, intermediate & lateral**
- ❑ They descend in front of the clavicle to supply skin of pectoral region till level of **the sternal angle**.
- ❑ Lateral supraclavicular n supplies skin over upper 1/2 of deltoid.

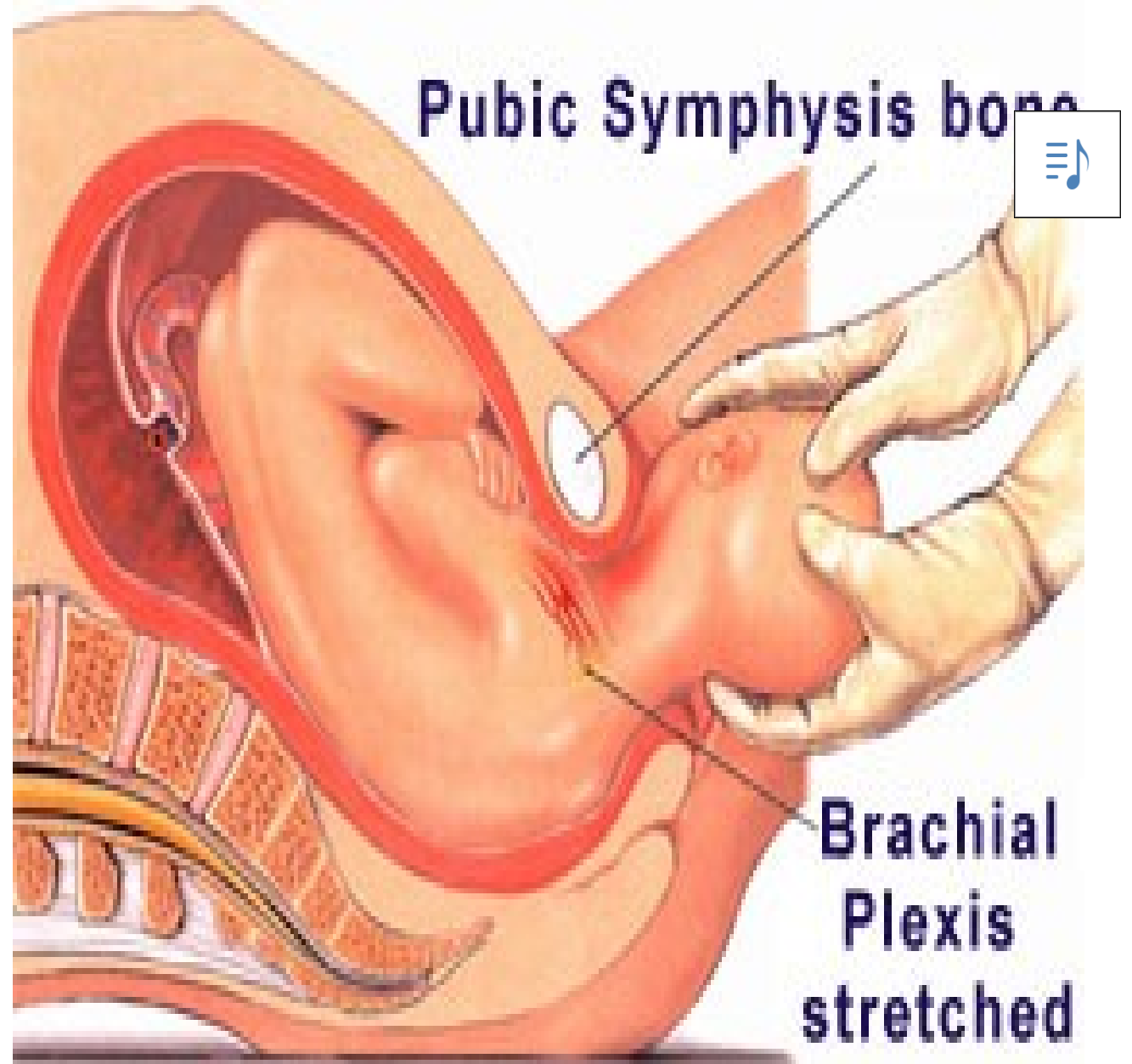


- **ERB'S PARALYSIS :**
{ Upper Trunk Injury }

- **Commonest injury of brachial plexus.**
- **Occurs in infants during difficult delivery**
- **Injury affects the upper trunk which is overstretched due to excessive traction on the neck**

6/11/24

Prof Azza Kamal/ Musculoskeletal & Integumentary System



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Brs of upper trunk

N to **S**ubclavius

Suprascapular n

divisions 2

Anterior division

Posterior division

Shares in forming
Lateral cord

Shares in forming
Posterior cord

Lateral pectoral
C5,6,7

Musculocutaneous
C5,6,7

Lateral root of
Median C5,6,7

Upper subscapular
C5,6

Lower subscapular
C5,6

N to latissimus
dorsi C6,7,8

Axillary n
C5,6

Radial n
C5,6,7,8,T1

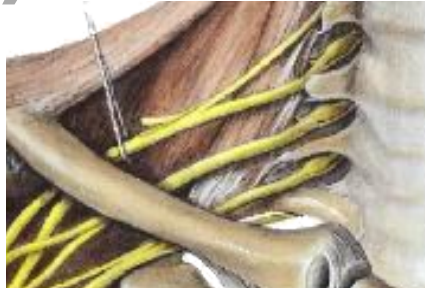


UPPER TRUNK LESION - C5,6 (ERB'S PARALYSIS)

Cause: difficult child birth

Effects:

- **Motor:** Upper limb is put in the following position :
 - **Arm** □ adducted & medially rotated
 - **Forearm** □ extended & pronated
 - **Wrist** □ flexed
- **Sensory loss:** lat side of arm & forearm & hand
- **Deformity:** Policeman or Waiter's tip position



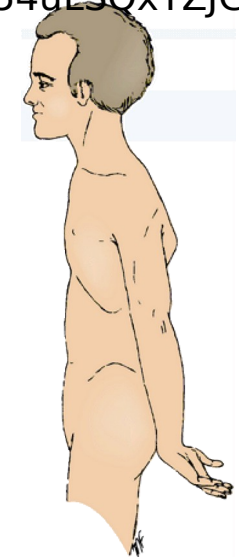
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ERB'S PARALYSIS

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**Deformity is called Waiter's
tip position**

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Integumentary System

19





Muscles paralyzed and effect of paralysis:

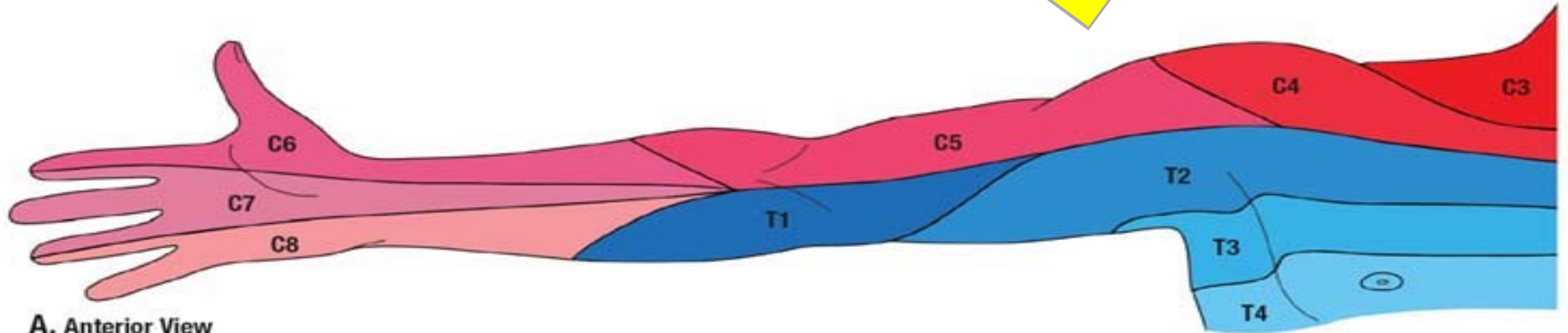
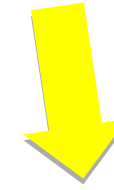
- 1. Supraspinatus & deltoid : loss of abduction of the arm □ the arm is adducted.**
- 2. Infraspinatus & teres minor : loss of lateral rotation of the arm □ the arm is medially rotated.**
- 3. Brachialis & biceps brachii : loss of flexion at the elbow □ the elbow is extended.**
- 4. Biceps, supinator &**



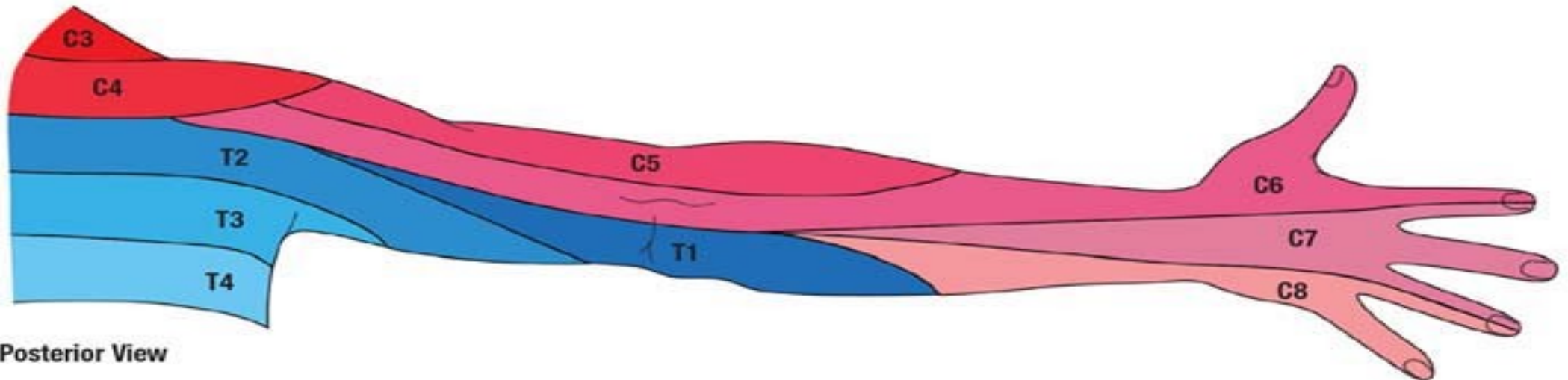
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A. Anterior View



B. Posterior View

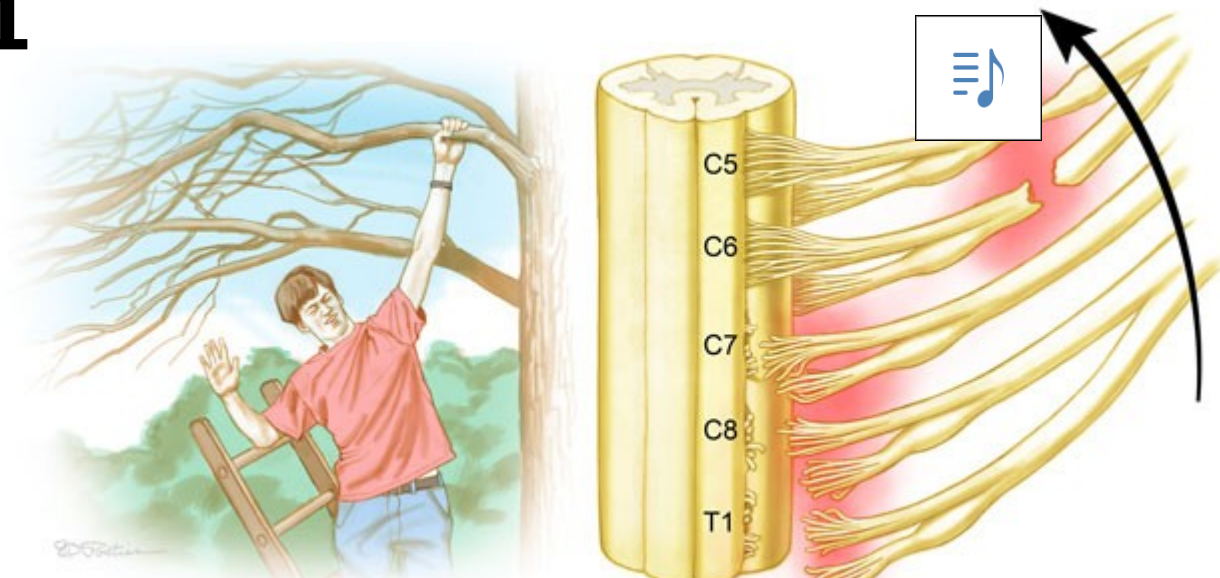
Sensory effects due to injury of C5,6

LOWER TRUNK LESION, C8 T1 (KLUMPKE'S PARALYSIS)

Cause: hyperabduction (as falling while hanging from a tree branch / traction on an abducted arm) or cervical rib

Effects:

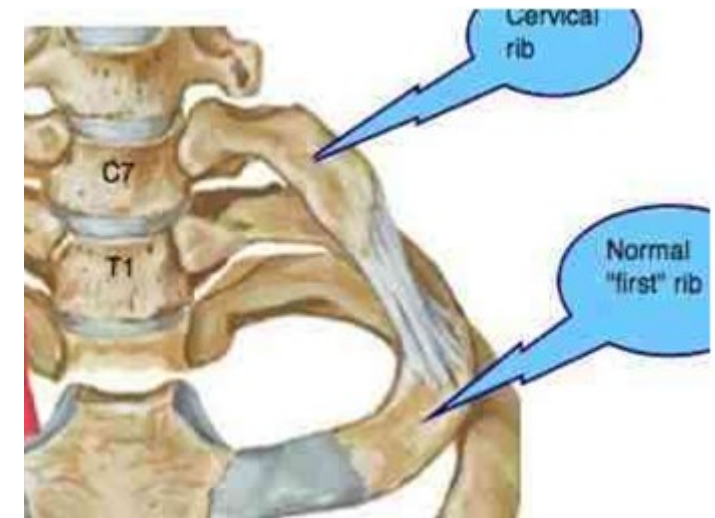
- **Motor:** Complete claw hand (intrinsic ms of hand)
- **Sensory Loss** : med side of arm, forearm & hand **T1** and **C8**.
- **Horner's syndrome (autonomic)**



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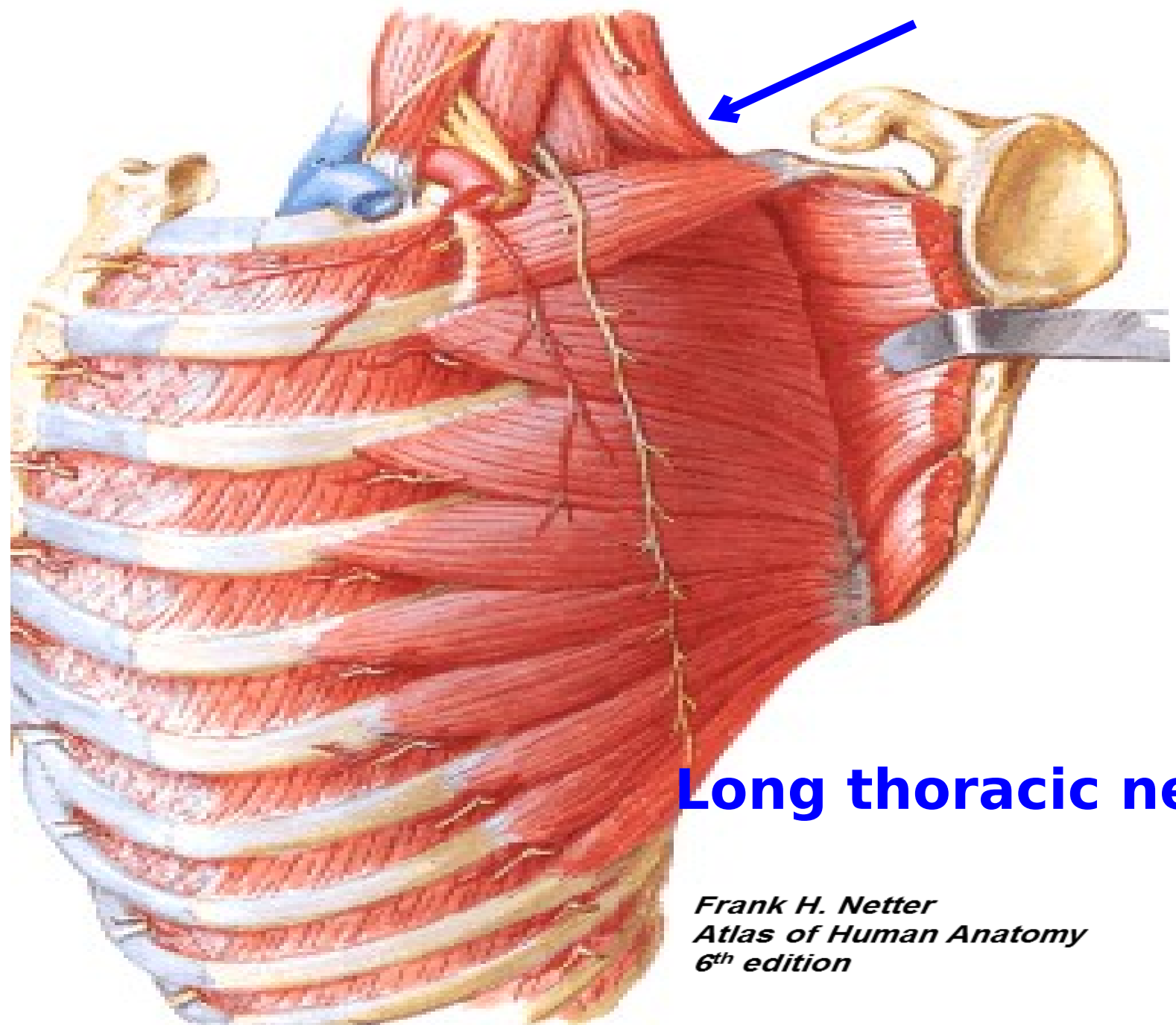


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A patient came to the emergency department after being shot in the posterior triangle of his neck. On examination, it was seen that all muscles of his upper limb were affected, Except:

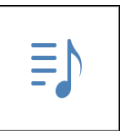
- a) Rhomboids
- b) Biceps
- c) Trapezius
- d) Hand muscles
- e) Triceps

- **Nerve to serratus anterior**
(long thoracic nerve)
C5,6,7 from roots of BP
- **Cause of injury:**
During radical mastectomy



Long thoracic nerve

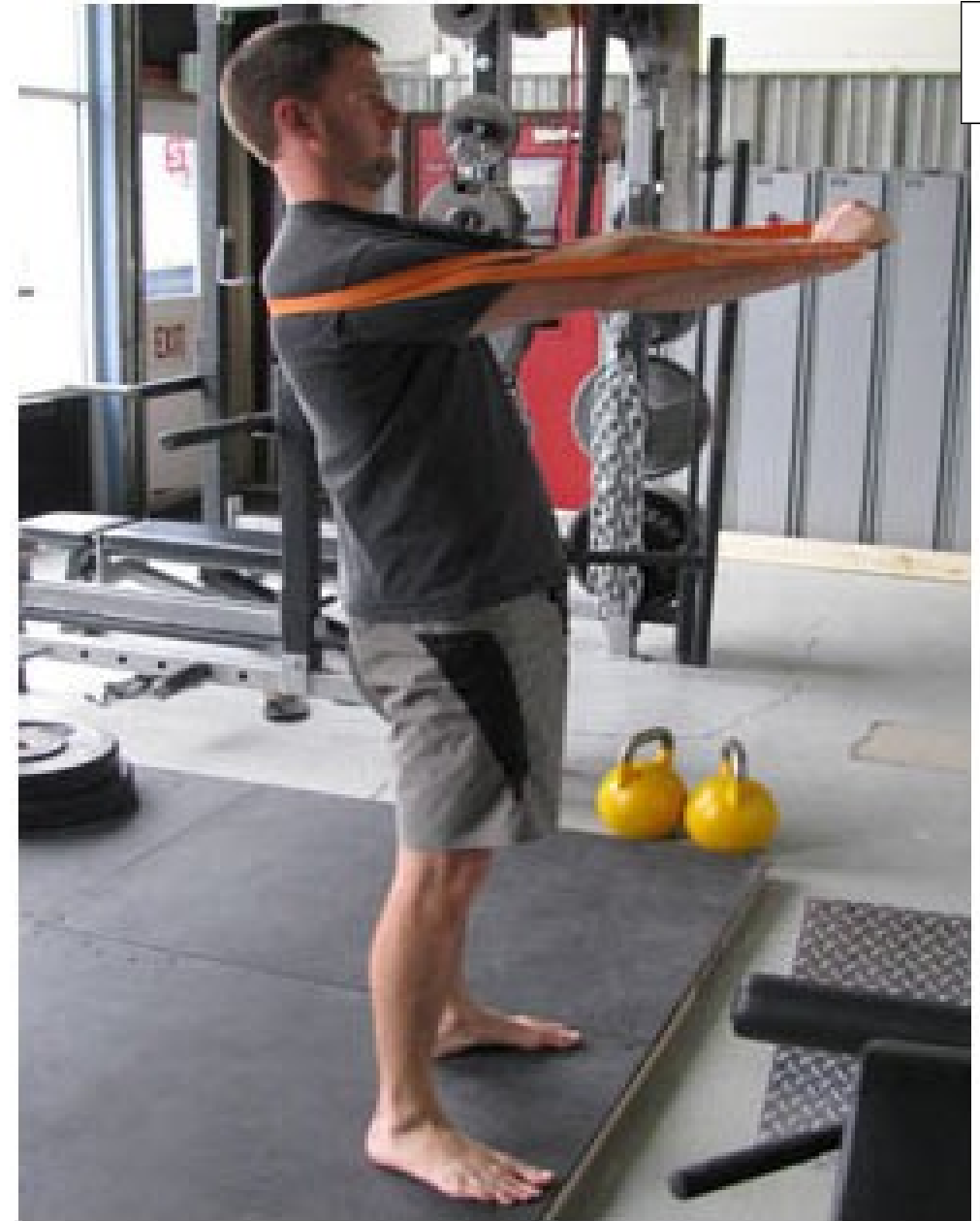
*Frank H. Netter
Atlas of Human Anatomy
6th edition*



- **Action of serratus anterior:**

- **1) Protraction & depression of the scapula**
- **2) With trapezius, produces upward rotation of scapula during raising the arm above the head**
- **3) Acting from its origin, it can elevate the ribs as in forced inspiration**

Prof Azza Kamal



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Applied Anatomy

- **Injury of long thoracic nerve leads to paralysis of serratus anterior** □ **winging of the scapula** (prominence of medial border of scapula i.e. it does not become in contact with



Prof Azz

<https://lh3.googleusercontent.com/Right winged scapula>

A female patient was operated for mastectomy. After the operation, she developed winging of the scapula. This could be due to injury of which of the following nerves?

- a) Thoracodorsal nerve
- b) Long thoracic nerve
- c) Upper subscapular nerve
- d) Axillary nerve
- e) Medial pectoral nerve



Suggested Textbook

Clinical Anatomy for Medical
Students/

Richard S. Snell

Third Edition/ Pages 428-433

Pages 527-528

To Be Continued